AMENDMENTS TO THE CLAIMS:

This listing of the claims will replace all prior versions, and listings, of the claims in this application:

Please cancel 51 without prejudice.

Listing of Claims:

1.-18. (Canceled)

19. (Currently Amended) A diffusion barrier comprising a plurality of stacked sub-layers, each sub-layer having a thickness of about 0.4 to about 4.5 ~~1.5~~ nanometers (nm)to inhibit the formation of a crystalline lattice, wherein the plurality of stacked sub-layers are arranged collectively to inhibit diffusion of a chemical species through the diffusion barrier, wherein a successive sub-layer comprises a different material from a material that comprises a preceding sub-layer and the different materials selected to comprise the sub-layers are substantially immiscible and exhibit mutual adhesion, and the overall thickness of the diffusion barrier is between about 30 and 50 angstroms, where the plurality of stacked sub-layers are three or more stacked sub-layers.

20. (Canceled)

21. (Previously Presented) A diffusion barrier as in claim 19, where one of the materials is scandium (Sc).

22. (Previously Presented) A diffusion barrier as in claim 19, where one of the materials is copper (Cu).

23. (Previously Presented) A diffusion barrier as in claim 19, where one of the materials is yttrium (Y).

24. (Previously Presented) A diffusion barrier as in claim 19, where one of the materials is lanthanum (La).

25. (Previously Presented) A diffusion barrier as in claim 19, where one of the materials is tantalum (Ta).

26. (Previously Presented) A diffusion barrier as in claim 19, where one of the materials is a metal nitride.

27. (Previously Presented) A diffusion barrier as in claim 19, where one of the materials is an oxide.

28. (Canceled)

29. (Canceled)

30. (Withdrawn) An integrated circuit comprising a substrate, having an electrically conductive feature disposed on said substrate, further comprising a diffusion barrier interposed between said substrate and said electrically conductive feature, said diffusion barrier comprising a plurality of stacked sub-layers, each sub-layer having a thickness predetermined to inhibit the formation of a crystalline lattice.

31. (Withdrawn) An integrated circuit as in claim 30, where at least one of said sub-layers is comprised of a metal.

32. (Withdrawn) A circuit structure comprising a substrate and an electrical interconnect comprised of copper (Cu), further comprising a diffusion barrier interposed between said substrate and said electrical interconnect, said diffusion barrier comprising a plurality of stacked sub-layers.

33. (Canceled).

34. (Canceled).

35. (Canceled).

36. (Canceled).

37. (Canceled).

38. (Currently Amended) A multilayer diffusion barrier comprised of interfaces and atomically thin films in which surface adhesion of each interface inhibits the formation of a lattice in the films, inhibiting diffusion across the barrier, wherein thickness of each film is in a range of about 0.4 to about 4.5 ~~1.5~~ nm, wherein a successive film comprises a different material from a material that comprises a preceding film, wherein the atomically thin films are at least three in number.

39. (Canceled)

40. (Canceled)

41. (Currently Amended) A multilayer diffusion barrier structure comprised of three or more sub-layers each having a thickness of about 0.4 to about 4.5 ~~1.5~~ nanometers (nm) and an interface, wherein the interface of each of the sub-layers dominates a lattice formation on the sub-layers, preventing the formation of a lattice and grain boundaries, the multilayer structure being arranged to inhibit diffusion of a chemical species through the structure, wherein a successive sub-layer comprises a different material from a material that comprises a preceding sub-layer.

42. (Canceled)

43. (Currently Amended) A multilayer diffusion barrier for inhibiting diffusion of chemical species there through, comprising a plurality of stacked layers, the thickness of each of said films being between about 0.4 to about 4.5 nm, which is predetermined to substantially eliminate work hardening, wherein a successive layer of the plurality of stacked layers comprises a different metal from a metal that comprises a preceding layer

of the plurality of stacked layers, wherein the plurality of stacked layers are at least three in number.

44. (Currently Amended) A diffusion barrier having a multilayer structure comprised of at least three ~~two~~ films forming a bond at an interface between each film, each film having a thickness of about 0.4 to about 4.5 ~~1.5~~ nm, wherein the interface dominates a lattice formation, inhibiting the formation of a lattice and grain boundaries, wherein a successive film comprises a different material from a material that comprises a preceding film, wherein at least one of the films comprises a dielectric material.

45. (Canceled)

46. (Canceled)

47. (Previously Presented) The multilayer structure of claim 44, wherein the at least two materials exhibit mutual adhesion and are substantially immiscible.

48. (Previously Presented) The multilayer structure of claim 44, wherein at least one of the materials is a metal.

49 (Previously Presented) The multilayer structure of claim 44, wherein at least one of the materials is a nitride.

50. (Canceled)

51. (Canceled).

52. (Previously Presented) The multilayer structure of claim 44, having flexibility and inhibited work hardening.

53. (Previously Presented) The multilayer structure of claim 44, which is a diffusion barrier between two materials that are otherwise capable of combining chemically or

between a layer and a surface capable of chemically combining with the layer.

54. (Previously Presented) A diffusion barrier as in claim 19, where said sub-layers are alternately comprised of copper (Cu) and tantalum (Ta).

55. (Previously Presented) A diffusion barrier as in claim 19, where said sub-layers are alternately comprised of scandium (Sc) and tantalum (Ta).

56. (Previously Presented) A diffusion barrier as in claim 19, where said sub-layers are alternately comprised of yttrium (Y) and tantalum (Ta).

57. (Previously Presented) A diffusion barrier as in claim 19, where said sub-layers are alternately comprised of lanthanum (La) and tantalum (Ta).

58. (Previously Presented) A diffusion barrier as in claim 19, where at least one of the sub-layers comprises a metal nitride.

59. (Previously Presented) A diffusion barrier as in claim 19, where said sub-layers are alternately comprised of tantalum nitride (TaN) and titanium nitride (TiN).

60. (Withdrawn) A diffusion barrier as in claim 19, where said sub-layers are alternately comprised of different materials that exclude both tantalum nitride (TaN) and titanium nitride (TiN).

61. (Previously Presented) A diffusion barrier as in claim 19, where the plurality of sub-layers are between three and ten in number.

62. (New) A diffusion barrier as in claim 19, wherein each of the plurality of sub-layers comprises a metal.

63. (New) A multilayer diffusion barrier as in claim 38, wherein each of the atomically thin films comprises an element that is a metal.

64. (New) A multilayer diffusion barrier structure as in claim 41, wherein each of the sub-layers comprises a metal.

65. (New) The multilayer structure of claim 44, wherein each of the films comprises a metal.